

CLAIMS

1. A reciprocating compressor for compressing a refrigerant comprising:

5 a hermetic container to which a suction pipe and a discharge pipe are connected;

a driving unit having a stator fixed inside the hermetic container and a mover disposed spaced apart from the stator and linearly and reciprocally moved according to an interaction with the stator;

10 an organic compound refrigerant sucked into the suction pipe, having an combustibility and explosiveness and consisting of only carbon and hydrogen;

a compression unit for receiving a reciprocal motional force of the driving unit and making a compression operation on the organic compound refrigerant; and

15 a mineral-based lubricant filled at a lower portion of the hermetic container; and a lubrication unit for supplying the mineral-based lubricant to each motional portion of the driving unit and the compression unit and performing a lubricating operation

20 2. The reciprocating compressor of claim 1, wherein the stator comprises:

an outer stator fixed at the hermetic container;

an inner stator disposed with a certain air gap with an inner circumferential

surface of the outer stator; and

a winding coil wound at one of the outer stator and the inner stator, to which power is applied from an external source, and

the mover comprises:

5       magnets disposed at regular intervals between the outer stator and the inner stator and being linearly and reciprocally moved when power is applied to the winding coil; and

a magnet frame having the magnets mounted thereon and transmitting a linear and reciprocal motional force to the compression unit.

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3.       The reciprocating compressor of claim 1, wherein the compression unit comprises:

a piston connected to the mover and linearly and reciprocally moved;

a cylinder, into which the piston is slidably inserted, for forming a certain

15       compression chamber;

a suction valve mounted at a refrigerant passage formed at the piston and preventing a backflow of the refrigerant after being introduced into the compression chamber; and

20       a discharge valve mounted at the front side of the cylinder and performing an opening and closing operation on the compressed refrigerant.

4.       The reciprocating compressor of claim 1, wherein the lubrication unit comprises:

a lubricant pumping unit for pumping the lubricant filled as much as a certain amount at a lower portion of the hermetic container; and

a lubricant supply passage for supplying the lubricant pumped by the lubricant pumping unit to a frictional portion between the piston and the cylinder.

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5. The reciprocating compressor of claim 1, wherein the refrigerant is isobutane (R600a) which is hydrocarbon-based and has a molecular formula of  $\text{CH}(\text{CH}_3)_3$ .

10 6. The reciprocating compressor of claim 1, wherein the lubricant is a paraffin-based lubricant.

15 7. The reciprocating compressor of claim 1, wherein the lubricant has a density of 0.866~0.880 g/cm<sup>3</sup> at a temperature of 15°C and a flash point of above 140°C.

20 8. The reciprocating compressor of claim 1, wherein the lubricant has a kinematic viscosity of 7.2~21.8 mm<sup>2</sup>/s at a temperature of 40°C and a viscosity index of 73~99.

9. The reciprocating compressor of claim 1, wherein the lubricant has a flow point of below -25°C and a total acid number of below 0.01 mgKOH/g.

10. The reciprocating compressor of claim 1, wherein the lubricant has a water content of below 20 ppm and a breakdown voltage of above 30kV.